

## A lesson from inappropriate single closure of a perforation during endoscopic submucosal dissection

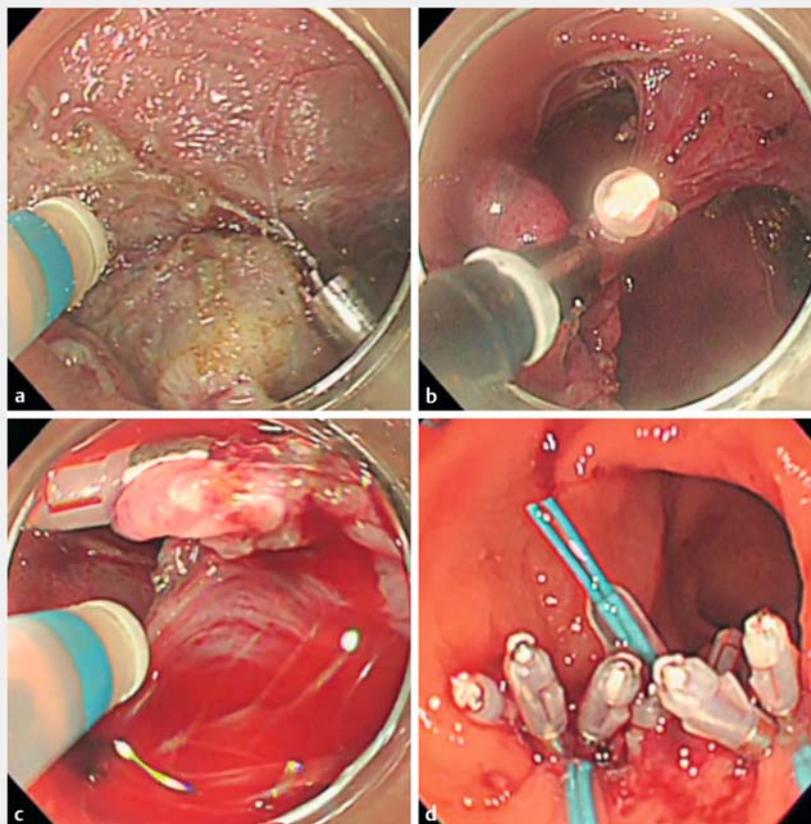
We report repeated perforations during colorectal endoscopic submucosal dissection (ESD) and successful endoscopic closure.

A 72-year-old man with a laterally spreading tumor, 25 mm in diameter, in the lower rectum was referred for ESD. ESD was started from the anal side using a DualKnifeJ (Olympus, Tokyo, Japan). The lesion had severe fibrosis in the submucosal layer. The submucosal layer was not clearly identified, and a perforation occurred. Clipping was immediately performed [1]; however, the clip interfered with subsequent submucosal dissection (► Fig. 1 a, ► Video 1), and another perforation occurred. Clipping was immediately performed. ESD was continued from the oral side with retroflexed endoscopic view. Carbon dioxide insufflation is essential in this situation [2], and adequate colon preparation is also an important factor when considering the management of such complications [3]. The clips interfered with final submucosal dissection.

We could not pull the clip out with a grasping forceps (► Fig. 1 b), and there was also concern about causing a larger perforation if we forcibly pulled it. Therefore, we had no choice but to cut the muscle layer with the DualKnifeJ to achieve en bloc resection (► Fig. 1 c). After the removal of the specimen, the perforations were closed using endoclips. Furthermore, complete closure was performed using the endoloop/clips technique in a purse-string fashion [4, 5] (► Fig. 1 d).

A lesson from this case is that immediate clipping after perforation could interfere with subsequent submucosal dissection. Before the application of the first clip, additional submucosal dissection should be performed in order to make sufficient space for clipping.

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► Fig. 1 Repeated perforations during colorectal endoscopic submucosal dissection. **a** The clip for a perforation interfered with subsequent submucosal dissection. **b** The clip could not be pulled out with a grasping forceps. **c** We had no choice but to cut the muscle layer with the DualKnifeJ (Olympus, Tokyo, Japan) to achieve en bloc resection. **d** Complete closure was performed using the endoloop/clips technique in a purse-string fashion.

### Competing interests

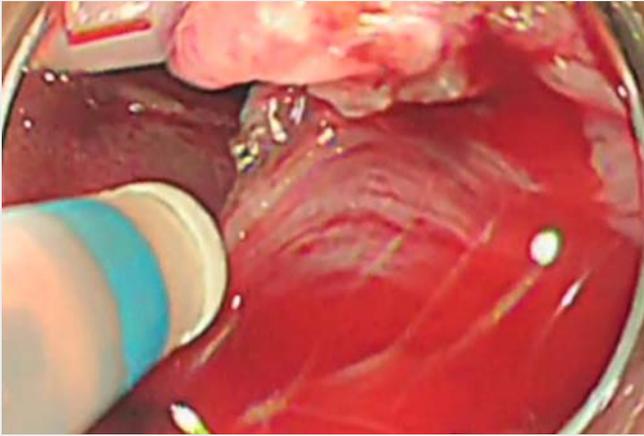
None

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**▶ Video 1** Inappropriate single closure of a perforation during endoscopic submucosal dissection (ESD). Rectal ESD was performed. The lesion had severe fibrosis in the submucosal layer. A small perforation occurred, and clipping was immediately performed. However, the clip interfered with subsequent submucosal dissection, and another perforation occurred. The previous clips interfered with final submucosal dissection, and we had no choice but to cut the muscle layer. Before the application of the first clip, we should consider whether more dissection is needed before effective clipping. Additional submucosal dissection should be performed in order to make sufficient space for clipping.

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